

REMARKS

The claims have been amended to be directed to resin plates. Support for this amendment exists throughout the present specification, including the examples.

Claim 1 has been amended so that it is directed to the subject matter of claim 15 (the polyfunctional (meth)acrylate is ethyleneglycol dimethacrylate). Accordingly, claim 15 has been canceled.

Claims 1 and 19 have also been amended such that they include an edge which is a light entrance on the resin plates. Support for this amendment exists throughout the present specification, including page 2, lines 23-24.

Claims 1, 3-7, 9-14 and 16-19 are currently pending.

The Office Action rejected claims 1, 3-6 and 9-19 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement, and claims 7 and 19 under 35 U.S.C. § 112, second paragraph, as indefinite. In view of the above claim amendments, Applicants respectfully submit that these rejections have been rendered moot, and that these rejections should be reconsidered and withdrawn.

The Office Action also rejected (1) claims 1, 3-7, 9-14 and 16-18 under 35 U.S.C. § 102 as anticipated by, or under 35 U.S.C. § 103 as obvious over, JP 2002-256128 (“Masuda”), (2) claims 9-14 claims under 35 U.S.C. § 102 as anticipated by PCT patent application publication no. WO 02/39153 (U.S. patent 6,941,056) (“Hirota”), (3) claims 1, 3-7 and 15-18 under 35 U.S.C. § 103 as obvious over Masuda in view of U.S. patent 5,726,268 (“Sakamoto”), and (4) claims 1, 3-7 and 15-18 under 35 U.S.C. § 103 as obvious over Hirota in view of JP 60-258219 (“Hasegawa”). In view of the following comments, Applicants respectfully request reconsideration and withdrawal of these rejections.

By incorporating the subject matter of claim 15 into claim 1, rejections based solely on Masuda or Hirota (rejections (1) and (2)) have been rendered moot --- claim 15 was not rejected over Masuda or Hirota alone. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of (1) claims 1, 3-7, 9-14 and 16-18 under 35 U.S.C. § 102 as anticipated by, or under 35 U.S.C. § 103 as obvious over Masuda and (2) claims 9-14 claims under 35 U.S.C. § 102 as anticipated by Hirota.

Regarding the two remaining § 103 rejections, the references upon which the Examiner has relied neither teach nor suggest the presently claimed invention.

The claimed invention relates to a sheet for light guiding plates, where the resin comprises 0.01 ppm to 1000 ppm of a particulate diffusing agent and a polymer obtained by polymerizing a mixture comprising a polymerizable material consisting of methyl methacrylate and a monofunctional acrylate, and ethyleneglycol dimethacrylate, wherein the content of the monofunctional acrylate in the polymerizable material is 9 % by weight or less and the content of the ethyleneglycol dimethacrylate in the mixture is 0.15 to 2 parts per 100 parts by weight of the polymerizable material.

As recognized by the Office Action, the primary references (Masuda and Hirota) neither teach nor suggest the claimed polymers which, among other things, possess ethyleneglycol dimethacrylate.

In this regard, Masuda (at par. [0013]) neither teaches nor suggest combining a monofunctional acrylate together with a polyfunctional (meth)acrylate, let alone combining a monofunctional acrylate with ethyleneglycol dimethacrylate. That Masuda would not lead one skilled in the art to the required combination is evidenced by the fact that Masuda's examples do not employ any polyfunctional (meth)acrylate, let alone ethyleneglycol dimethacrylate.

Furthermore, not only does Masuda fail to disclose the required constituents of the claimed polymerizable material, Masuda also fails to disclose specific concentration ranges for these individual constituents. Nowhere does Masuda teach or suggest that the content of the monofunctional acrylate in the polymerizable material should be 9 % by weight or less and the content of the ethyleneglycol dimethacrylate should be 0.15 to 2 parts per 100 parts by weight of the polymerizable material.

The significance of Masuda's failure to teach or suggest the claimed polymer is that Masuda cannot teach or suggest, expressly or inherently, the benefits associated with the present invention including improved processability (for example, cutting and polishing). The examples in the present application demonstrate the significance of the requirements set forth in the pending claims, and the benefits associated with such requirements, which are neither taught nor suggested by Masuda.

For example, comparative example 3 contains 10% monofunctional acrylate and, thus, falls outside the pending claims. As indicated in Table 1 (at page 12), this comparative example suffered significant scorching during cutting. This example demonstrates the significance of the limitation that "the content of the monofunctional acrylate in the polymerizable material is 9 % by weight or less."

Also, comparative example 1 contains no ethyleneglycol dimethacrylate. As indicated in Table 1 (at page 12), this comparative example also suffered significant scorching during cutting. This example demonstrates the significance of the limitation that "the content of the ethyleneglycol dimethacrylate in the mixture is 0.15 to 2 parts per 100 parts by weight of the polymerizable material."

Finally, Masuda discloses forming materials using injection or extrusion molding (see par. [0020]) instead of forming the polymers through polymerization in a mold (as per the

claimed methods). Masuda's methods cannot provide the improved processability which the presently claimed methods provide.

Clearly, Masuda neither teaches nor suggests the specific polymer components in the specific concentrations of the claimed invention, nor any of the benefits associated with the claimed invention, particularly the improved processability (e.g., cutting, polishing) of these materials. Nor does Masuda provide any motivation to modify his disclosure in such a way to focus on the claimed invention, using the required materials in the required amounts.

Sakamoto cannot compensate for Masuda's fatal deficiencies. Sakamoto neither teaches nor suggests that (1) ethyleneglycol dimethacrylate must be present; (2) monofunctional acrylate be present in an amount less than or equal to 9%; and (3) ethyleneglycol dimethacrylate must be present in an amount of 0.15-2%. Thus, the combination of Masuda and Sakamoto cannot lead to the claimed invention which requires specific materials in specific concentrations.

More specifically, Sakamoto relates to extrusion or injection molding. In such moldings, the employed resins must have a high melt flow property. However, as the content of polyfunctional (meth)acrylates increases, the melt flow properties of the resins deteriorate (due to crosslinking). Thus, the content of such materials in injection/extrusion molding is much less than those in sheets for light guiding plates (see, e.g., Sakamoto's examples which contain 0.030-0.079 parts by weight of ethylene glycol dimethacrylate (EGDMA)(see Table 1)).¹ In other words, disclosure concerning resins in injection/extrusion moldings teach or suggest nothing about resins in sheets for light guiding plates.

Finally, in Sakamoto, there is described "Content of the polyfunctional monomer generally has functional groups of from 1×10^{-5} to (chain transfer agent (mole) - 2.5×10^{-4}) equivalent per 1mole of the monofunctional monomer." (See lines 59 to 62 in column 4).

When a calculation is made based on this description and using the contents of mercaptan (0.063 parts by weight), methyl methacrylate (96 parts by weight) and butyl acrylate (4 parts by weight) and the conversion (26%) in Example 1 of reference 2 the present specification, the above content range of the functional groups is converted to the content range of from 1×10^{-5} to 1.71×10^{-4} 8.5×10^{-5} equivalent per 1mole of the monofunctional monomer, and in contrast, the content range of from 0.15 to 2 parts per 100 parts by weight of the polymerizable material that is claimed in the present application is similarly converted to the content range of the functional groups of from 2.07 2.1×10^{-3} to 2.76 2.8×10^{-2} equivalent per 1mole of the monofunctional monomer. Therefore, the content of polyfunctional monomers in Sakamoto is much lower than the content of ethyleneglycol dimethacrylate that is claimed in the present application.”

At any rate, the examples in the present application demonstrate significant advantages of the claimed invention over comparable, Masuda-esque or Sakamoto-esque compositions. Such benefits could not have been expected from Masuda’s or Sakamoto’s disclosures. These benefits, by themselves, demonstrate the novelty and non-obviousness of the claimed invention.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 103 based upon Masuda and Sakamoto.

Regarding the § 103 rejection based upon Hirota and Hasegawa, this combination of references does not yield the claimed invention either.

For example, as recognized by the Office Action, Hirota does not disclose the required polyfunctional (meth)acrylate.

Hasegawa does not compensate for Hirota’s deficiencies.

First, Hasegawa neither teaches nor suggests ethylene glycol di(meth)acrylate as required by the claims. Rather, Hasegawa discloses **poly**ethylene di(meth)acrylate (MW of

the polyethylene glycol part is 170-1020). Thus, Hasegawa neither teaches nor suggests the required ethyleneglycol dimethacrylate.

For at least this reason the rejection based upon Hasegawa and Hirota is improper and should be withdrawn.

Furthermore, Hasegawa discloses that substrates made of **poly**ethylene di(meth)acrylate having a MW lower than 170 is fragile and has inferior mechanical strength. Thus, no motivation would have existed to stray from Hasegawa's teachings to arrive at the claimed polymers.

Also, Hirota and Hasegawa are not properly combinable: they relate to non-analogous arts. Hirota relates to light guiding plates, while Hasegawa relates to optical disk substrates, not light guiding plates. One skilled in the art looking to modify Hirota's light guiding plates would not have looked to Hasegawa's optical disk substrates for motivation.

At any rate, as discussed above, the examples in the present application demonstrate significant advantages of the claimed invention over comparable compositions. Such benefits could not have been expected from Hirota's or Hasegawa's disclosures. These benefits, by themselves, demonstrate the novelty and non-obviousness of the claimed invention.

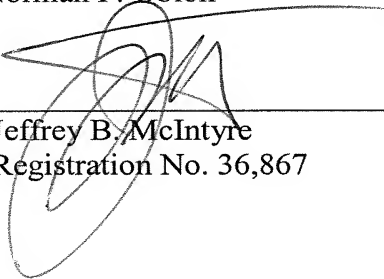
In view of the above, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 103 based upon Hirota and Hasegawa.

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Applicants believe that the present application is in condition for allowance. Prompt and favorable consideration is earnestly solicited.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Jeffrey B. McIntyre', is written over a horizontal line. The signature is stylized with loops and a long horizontal stroke extending to the right.

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